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| Brookhaven National Laboratory National Synchrotron Light Source | | Number: LS-PPS-0005 | Revision: B |
| | | Effective: 3/27/02 | Page 1 of 5 |
| Subject: <u>X17B1</u> Radiological Interlock Test | | | |
| Prepared/ M. Buckley | | Approved By: S.Buda | |
| Approved By: | | Revision/Periodic Review Log | |

*Approval signatures on file with master copy.

| | | |
|--------------|--|--------------|
| Test Reason: | Test Result: <input type="checkbox"/> Passed <input type="checkbox"/> Failed | |
| | Test Type: <input type="checkbox"/> Full <input type="checkbox"/> Partial | |
| Test Date: | Start Time: | Finish Time: |
| Tester 1: | Assistant 1: | |
| Tester 2: | Assistant 2: | |

PREPARATION:

Inform control room operator that test will be done.

Turn off 'Red Tag' switch on x-ray ring interlock, and apply LOTO to X-Ray Security system.

Verify that vacuum valves and water interlocks are satisfied on X17B1.

1. Search the hutch

The overhead lights go out _____
The red interior light comes on _____
The audible alarm sounds for 13 to 15 seconds minimum _____
The hutch interlock sign turns on _____

2. Open hutch door

The hutch interlock sign goes out _____

3. Press CS-1, close hutch door and wait.

Hutch interior lights come on in not more than 20 seconds _____

Press CS-E.

Interlock does not activate _____

4. Press interior search button, close door, press CS-E, note that alarm comes on, open and close door, press CS-E again. (This must all be done in less than the timeout interval noted in step 3).

Interlock does not activate _____

5. Secure Transport Hutch. Search X17B1 hutch, one person remains inside

The Small Transport Enclosure Safety Shutter (STRESS)
"enable" light does not come on until the end of the
warning interval. _____

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- | | | <u>ES1</u> | <u>ES2</u> |
|-----|---|-------------------|-------------------|
| 6. | The person inside presses an Emergency Stop Button. | | |
| | The shutter "enable" light goes out | _____ | _____ |
| | The ES indicator comes on | _____ | _____ |
| | The ES latch cannot be reset unless the SOR key is turned | _____ | _____ |
| 7. | Turn mode switch to "white". Place latch device on door lock so key can be removed. Place switch holders on door switches. Search hutch, put door key in SRU and turn, and open STRESS and Beamline Safety Shutter (BLISS). Remove holder from switch 2. | | |
| | The "Beam ON" signs turns on | | _____ |
| | RIB latch light comes on | | _____ |
| 8. | Replace holder on switch 2. | | |
| | RIB cannot be reset unless SOR key is turned. | | _____ |
| 9. | Remove holder on switch 1. | | |
| | STRESS shutter closes | | _____ |
| | BLISS shutter closes | | _____ |
| | RIA latch comes on | | _____ |
| | Hutch interlock drops out | | _____ |
| | RIA can't be reset w/o SOR | | _____ |
| 10. | Replace holder on switch 1. Search hutch, leave shutter closed. | | |
| | Hutch Kirk key (KKH) cannot be removed from SRU unless button is pushed | | _____ |
| 11. | Open STRESS shutter. | | |
| | KKH cannot be removed even if button is pushed | | _____ |
| 12. | Close shutters. Turn KKH and note where solenoid unit stops rotation. Push the button and turn key just beyond this point, but not far enough to actuate "key removed" switch. Release the button and leave key in this position. Open shutters, remove KKH, and replace. | | |
| | RIA latch light comes on | | _____ |
| | RIB latch light comes on | | _____ |
| | The STRESS shutter closes | | _____ |
| | The BLISS shutter closes | | _____ |
| | Reset RIA and RIB. | | |
| 13. | Open STRESS shutter, and press an emergency stop button. | | |
| | RIA latch light comes on | | _____ |
| | RIB latch light comes on | | _____ |
| | Hutch interlock drops out | | _____ |
| | STRESS closes | | _____ |
| | BLISS closes | | _____ |
| | Reset RIA, RIB and ES | | |

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14. Secure transport hatch. Open STRESS B by pressing and holding the button on the air solenoid.
The BLISS remains closed.
Remove holder on switch 2 and replace.
RIB trips _____
Reset RIB, release switch 1 _____
RIA trips _____
15. Close STRESS. Search hatch. Turn off air to STRESS, cycle shutter open & closed until it remains closed when open button is pressed.
Open BLISS and release switch 2.
RIB trips _____
Reset RIB, release switch 1 _____
RIA trips _____
BLISS closes _____
Open air valve to solenoid bank.
16. Switch to MONO mode. Search hatch. Open STRESS and BLISS. Remove holder on switch 2 and replace.
RIB trips _____
Reset RIB, release switch 1 _____
RIA trips _____
BLISS closes _____
STRESS closes _____
Hutch Interlock drops out _____
Reset RIA, search hatch.
17. Cheat hatch SRU, open STRESS and BLISS.
Remove hatch Kirk key
RIA trips _____
RIB trips _____
STRESS closes _____
BLISS closes _____
Replace key
18. Open STRESS and BLISS. Press an Emergency Stop
RIA trips _____
RIB trips _____
STRESS closes _____
BLISS closes _____
Reset RIA, RIB, and ES. Search hatch.
19. Beam line lockout key can be removed only if button on SRU is pushed _____
Open STRESS _____
Beam line lockout key can't be removed even if button is pushed _____

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20. Close STRESS, cheat SRU, and open STRESS. Leave BLISS closed. Remove lockout key, and replace.

| | |
|----------------------------|-------|
| RIA trips | _____ |
| RIB trips | _____ |
| STRESS closes | _____ |
| SPA comes on when key in | _____ |
| SPA can't be reset w/o SOR | _____ |

21. Complete steps 21 - 23 for both beam modes.

Open STRESS and BLISS

| | <u>Mono</u> | <u>White</u> |
|--|-------------|--------------|
| Backstop Kirk key cannot be removed from SRU unless button is pushed | _____ | _____ |
| Backstop Kirk key cannot be removed even if button is pushed | _____ | _____ |

22. Close shutters. Cheat SRU for backstop key. Open shutters. Remove backstop key from SRU.

| | | |
|---------------|-------|-------|
| RIA trips | _____ | _____ |
| RIB trips | _____ | _____ |
| STRESS closes | _____ | _____ |
| BLISS closes | _____ | _____ |

23. Reset RIA and RIB. Unlock backstop and lower enough to put latch device on backstop lock and return key to SRU. Hold both backstop upper limit switches. Open BLISS & STRESS. Release left switch.

| | | |
|--------------------------------------|-------|-------|
| RIB trips | _____ | _____ |
| Release right switch | | |
| RIA trips | _____ | _____ |
| Reset RIA and RIB and close shutters | | |

24. Remove latch device from backstop lock, using key from SRU. Move backstop to in-beam-position, then back out.

| | | |
|---|-------|-------|
| Both limit switches operate freely and each makes a "click" when stop is moved from the in-beam position. | _____ | _____ |
|---|-------|-------|

25. Open the STRESS. Remove the Control Room Shutter Enable Key for X17B1, and then replace the key.

| | |
|---|-------|
| STRESS closes | _____ |
| RIA trips | _____ |
| The "Control Room Inhibit" light comes on | _____ |
| The SPA latch comes on (after the key is back on) | _____ |
| STRESS cannot be opened | _____ |
| Reset RIA and SPA | |

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26. One person goes to the x-ray equipment area and observes the indicators for RIAX and RIBX.
Open STRESS and BLISS. Remove switch holder from door switch number 2.

RIB latch light comes on _____

RIBX trips _____

Replace switch holder. Attempt to reset RIBX.

RIBX will not reset _____

Reset RIB.

RIBX resets _____

27. Remove holder from door switch 1.

RIA latch light comes on _____

RIAX trips _____

Attempt to reset RIAX

RIAX will not reset _____

Reset RIA

RIAX resets _____

28. Open the Safety Shutter.

Turn "Auto Open" key to "ON".

At the Control Room Operator's Console, switch the shutter master enable to "Inhibit" and back to "Enable".

The safety shutter closes _____

And then re-opens _____

Turn "Auto Open" key to "OFF".

Switch the master enable to "Inhibit" and back to "Enable"

The safety shutter closes _____

And does not re-open _____

29. Go to the X-17B1 hutch. Remove the holders from the switches. Remove the latch device from the door lock. Stand inside the hutch and open and close the door.

Both door switches operate freely and each
"clicks" when door is opened _____

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